



D3000 (P/N: 100400-1)

Iridium/GPS Terminal

Installation Guide

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REVISION HISTORY

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-	06/13/2007	Monir Elias	100458	Initial Draft
1.1	07/26/2007	Monir Elias	100458	Added power information and call to addendum 100459

TABLE OF CONTENTS

REVISION HISTORY	2
INTRODUCTION	4
APPLICATION.....	4
WARNING.....	4
SYSTEM DESCRIPTION & OPERATION.....	5
General	5
System Components	5
D3000 OVERVIEW.....	6
Specifications.....	6
Features.....	6
D3000 Installation	7
Iridium/GPS Antenna (p/n 100430).....	11
Antenna Description	12
Antenna Installation.....	13
POWER WIRING – INSTALLATION OPTIONS	14
POWER-UP TEST	15
SERVICE ACTIVATION.....	16

INTRODUCTION

APPLICATION

This guide is applicable to the following components:

Part Number	Component Description
100400-1	D3000 Terminal
100420	D3000 ICB (Iridium/Cable/Bracket) Set
100430	Iridium/GPS Antenna
100431	Suction Mount for 100430 Antenna
100297	Cigarette Lighter Adapter
100459	"In-Vehicle Installation Options" Guide
Notes	

WARNING

Information, drawings and wiring diagrams contained in this manual are intended as a reference for engineering planning only. Drawings and wiring diagrams contained herein do not represent any specific installation. It is the installer's responsibility to create installation drawings specific to the mobile asset.

SYSTEM DESCRIPTION & OPERATION

General

The Blue Sky Network's D3000 is an Iridium Satellite Packet Data Terminal. Roughly the size of a car stereo, it can easily be installed on a land vehicle or a marine vessel for instant global tracking and 2-way communication.

All data services are managed by the customer through our web-based SkyRouter or other third-party applications (like Intergraph's). Skyrouter offers global asset tracking, account management features, such as user authorization, asset settings, messaging and billing information.



System Components

- D3000 Terminal
- D3000 ICB Set
- Iridium/GPS Antenna (with integrated cables)
- Antenna Suction Mount (optional)
- Cigarette Lighter Adapter (optional)

D3000 OVERVIEW

Specifications

Length	7.87" or 200 mm (9" or 228mm with ICB)
Width	3.22" or 82 mm (5" or 127mm with ICB)
Depth	1.5" or 38 mm (2.5" or 64mm with ICB)
Weight	1.1lb or 0.5Kg (2.0 lb or 0.9Kg with ICB)
Power Requirements	9VDC - 18VDC
Nominal Current	0.5A Continuous, 1.0A Peak at 12V
Operating Temperature Range	-20 degrees C to + 70 degrees C
Iridium SBD Frequency	L-Band
GPS Frequency	L-Band
LED Indicator	Power (ON/OFF)
I/O Ports	2 Serial Ports (RS-232)
Antenna	Dual terminal GPS/Iridium combined

Features

Worldwide - The D3000 is a truly global satellite communication solution, based on the Iridium satellite network.

GPS - The D3000 has an integrated GPS. Users can define position reporting intervals via the unit, locally or remotely.

Asset Tracking - Directly from our web-portal, SkyRouter (www.blueskynetwork.com), users can view the location of one or a fleet of mobile assets. Tracking data can also be utilized by third party tracking solutions, like Integraph's.

2-Way Messaging – The D3000 allows users to send and receive messages between vehicles or between dispatch and vehicle.

D3000 Installation

The location of the D3000 is at the discretion of the user. It is recommended that the unit is placed somewhere in the vehicle's dashboard, but consideration should be given to space, closeness to driver, environmental conditions and distance from the antenna. There are three main components needed for the D3000 installation efforts: **a)** D3000 Terminal; **b)** D3000 ICB Set; **c)** Antenna; and **d)** Power. Below you will find a description of the D3000 Terminal and the ICB Set. The Power and Antenna descriptions and installations are discussed in later sections.

D3000 Terminal

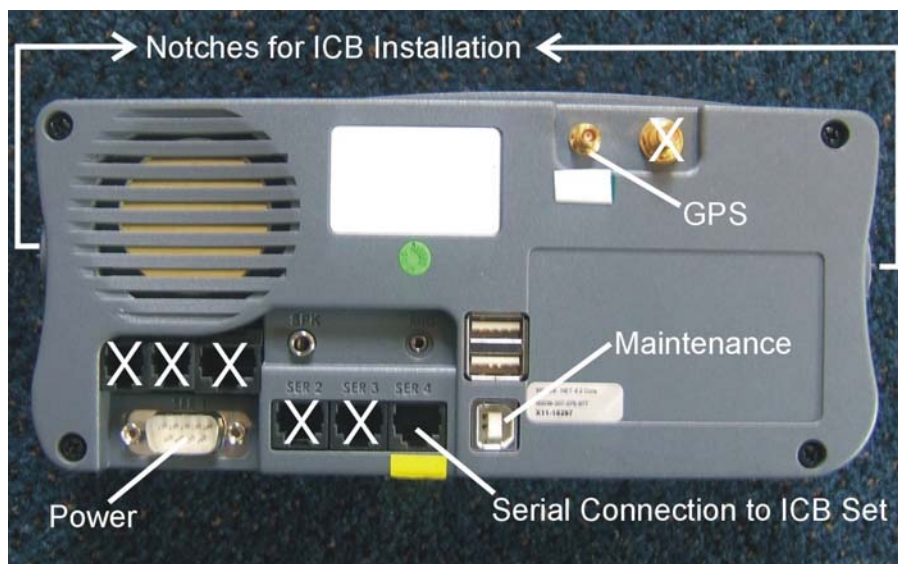
The D3000 Terminal (p/n 100400), discussed briefly early on this guide, consists of a device that, in addition to tracking, displays incoming messages and initiates outgoing messages, transmitted through a wireless communication system. Its rugged design, ergonomic user interface, full programmability and extensive expansion options, make it the ideal mobile data terminal for vehicles. It is built to withstand the extreme temperature range, vibrations and shock that a unit operating within the vehicle environment must endure, ensuring the high level of reliability required by a mission critical, mobile system.

The D3000 terminal has a pair of notches in each side (right and left) of the unit, allowing a solid link of the ICB Set (Mounting Bracket) to its sides. Please refer to D3000 Terminal + ICB Integration section for more details.



D3000 Terminal

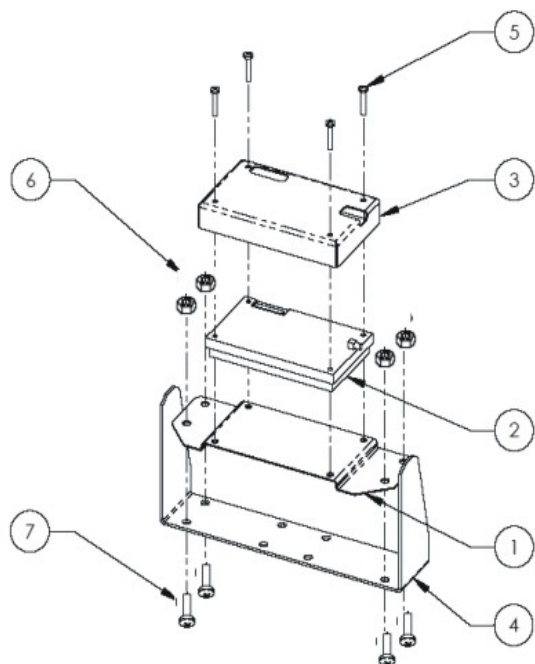
Dimensions: 200 x 82 x 38mm



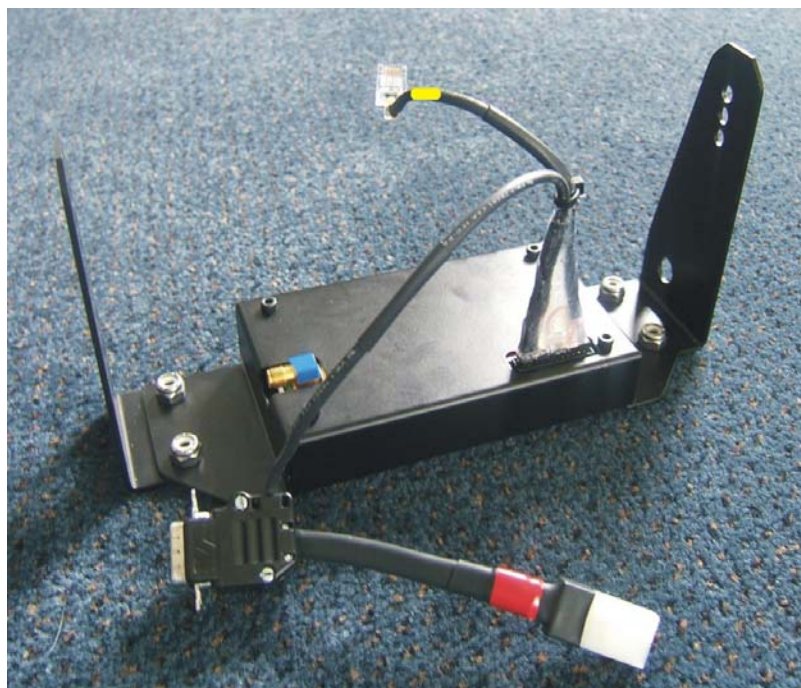
X = Port is Reserved

D3000 ICB (Iridium LBT, Cable, Bracket)

The D3000 ICB (p/n 100420, below) is pre-assembled and provided with each D3000 unit to be installed. The ICB Set provides the D3000 unit with the following capabilities: power connection ("red"), Iridium antenna ("blue"), serial communication ("yellow") and bracket holes for mechanical installation flexibility.



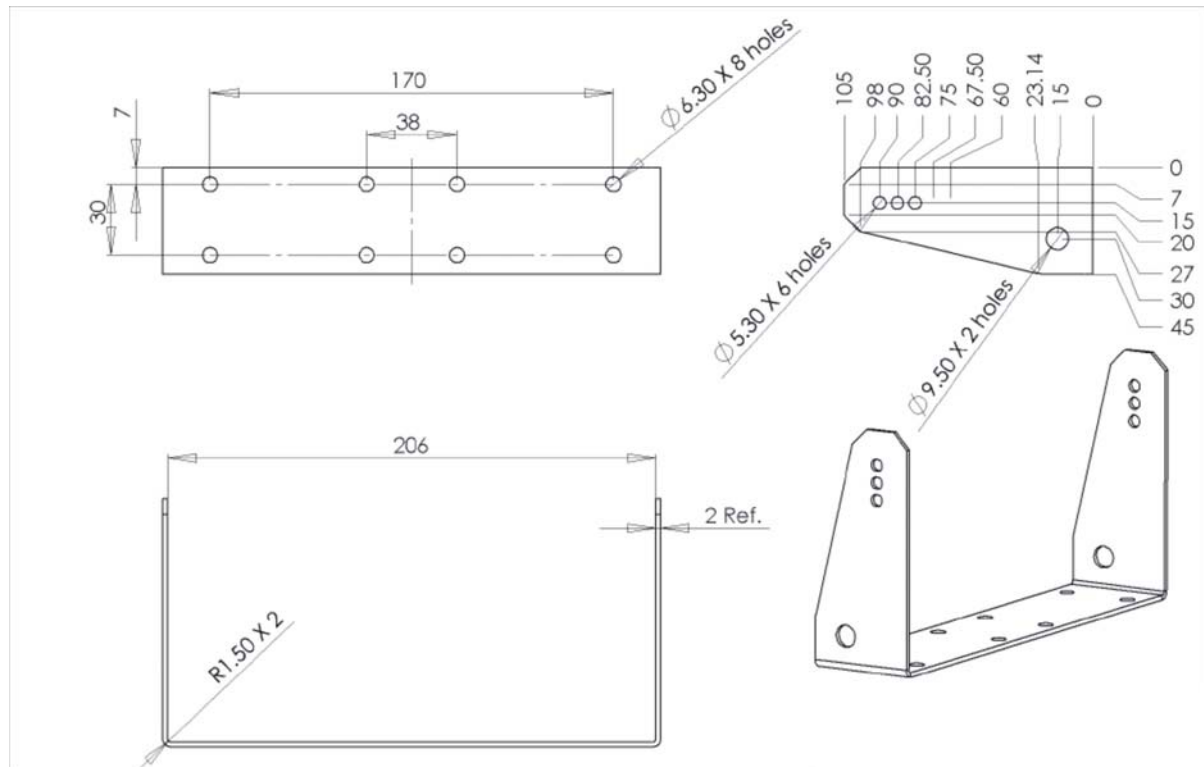
ICB Components (without the cable)



Pre-Assembled D3000 ICB Set

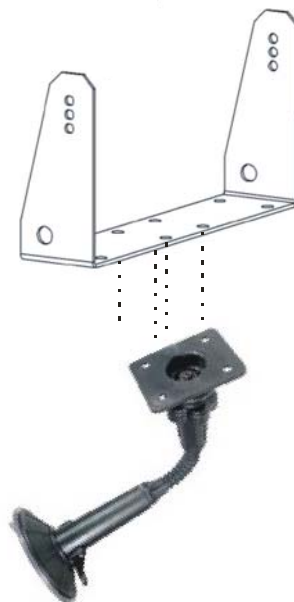
The ICB can be assembled directly into any surface with the appropriate hole configuration or bottom Velcro tape (for "**Quick Install**"). In addition, it can be used with a suction RAM mount, which allows for higher mechanical flexibility and better visualization of the front panel. The Velcro tape on the bottom of item 4 (above) is the quickest and easiest way to position the unit in a dashboard, for example, but other installations using screws are also viable options.

In order to install the ICB in a "fixed" configuration over a surface (with screws), the installer will need to first understand the configuration of the holes on the bracket (item 4, above). The drawing in the next page shows the bracket details, including the dimensions of the four center holes (for standard RAM mounts) and the two holes on each side (that can also be used to fix the unit).



Bracket Dimensions (in mm)

As mentioned earlier, the brackets can be affixed by means of four center holes (with a standard RAM suction mount – picture below) or the two side holes. In both cases, the user will need to remove the ICB nuts and screws (items 6 and 7 from previous page), add screws (in the case of RAM mount) and re-assemble the set accordingly.



D3000 Terminal + ICB Integration

- 1- Decide where in the vehicle or vessel (dashboard, ceiling etc) the D3000 will be installed. For instance, if the unit is going to be installed in the ceiling, the installer will need to fix the D3000 ICB set upside down in relation to the standard dashboard mount (see below). Start by affixing the bracket (ICB) in the desired position using a suction mount, velcro tape or screws;



Dashboard Mount-style

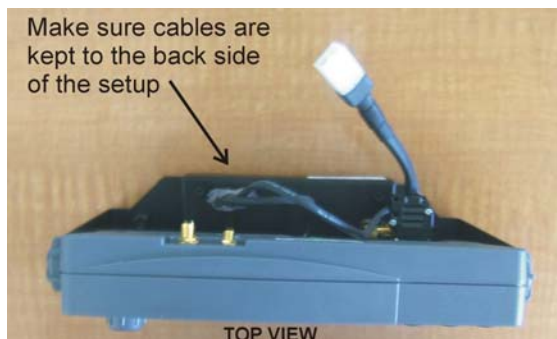


Ceiling Mount-style

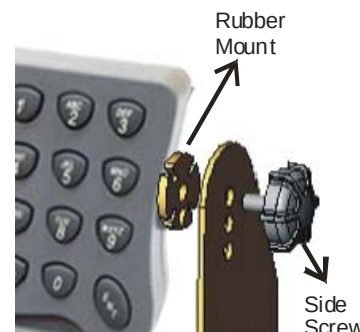
- 2- Align the bracket and terminal directions as shown below (cables always to the back side). Mount the round rubber mount on the right and left sides of the D3000 in a manner that allows the side screws to fit the top hole (out of the three, the one closest to edge) on the sides of the bracket (see below).



a) Position the bracket



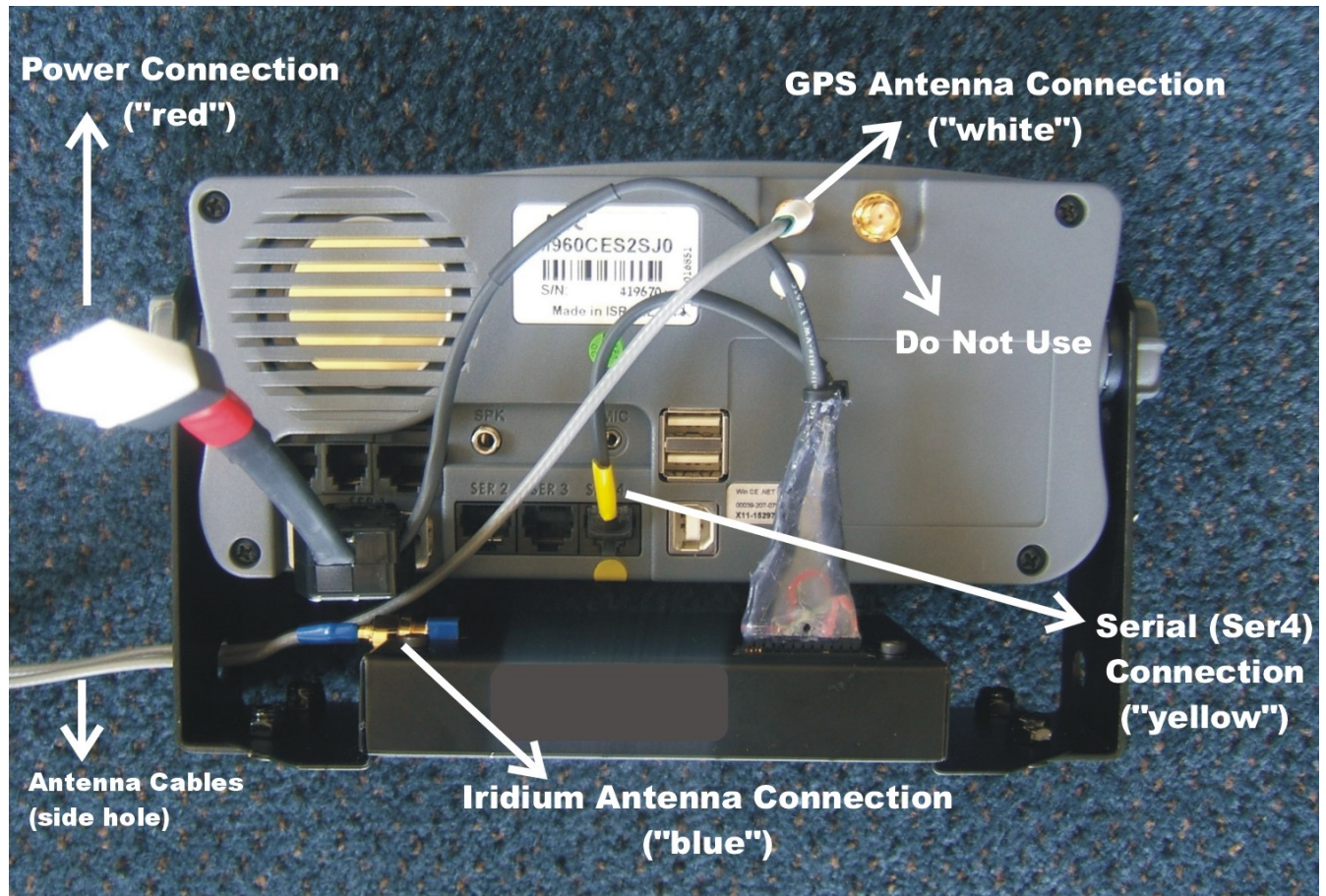
b) Align the terminal's back with ICB cables



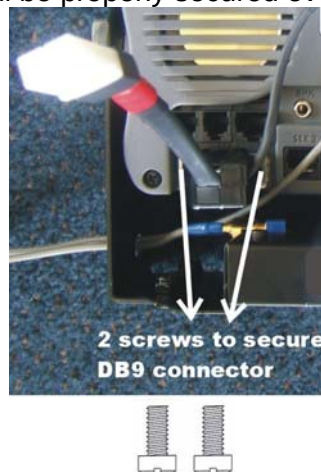
c) Insert side screws

Attach the screws from the outside of each side of the bracket so that it goes through the bracket hole and screws into the rubber mount, which is attached to the D3000 Terminal. Screw it in firmly, but do not over-tighten.

- 3- Connect the Antenna and ICB cables to the D3000 Terminal, by matching coded colors connectors to their respective port, as shown below.



- 4- Fix the Power Connector (DB9) into the D3000 Terminal by inserting the two side screws included in the installation plastic bag, like shown below. Please note that the right screw is tough to insert, and the unit will be properly secured even if only the left screw is installed.



NOTE: Consult the addendum "In-Vehicle Installation Options" Guide (p/n 100459) for more information on how to fix the D3000 unit in vehicles.

Iridium/GPS Antenna (p/n 100430)



Antenna Description

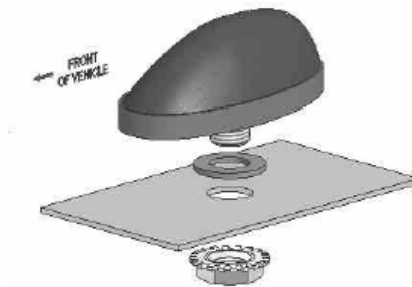
The 100430 is a ground plane independent, heavy duty combination Iridium/GPS antenna which uses two internally attached, distinct coaxial cables (for Iridium and GPS). In its original configuration, the antenna comes with cable length of 3m (10 ft) and SMA (Iridium) / MCX (GPS) terminating connectors.

TECHNICAL SPECIFICATIONS				
ELECTRICAL	Iridium			GPS
FREQUENCY	1610-1626,5MHz			
ELEMENT GAIN	4 dBi			5 dBiC
AXIAL RATIO	< 3 dB			< 3 dB
VSWR	<1,5			< 2:1
POLARISATION	CIRCULAR RHCP			CIRCULAR RHCP
DC GROUNDING	YES			
RADIATION PATTERN	HEMISPHERICAL			
AMPLIFIER GAIN				> 25 dB (+/- 1 dB)
NF (@5V 21°C)				<1,9 dB
VOLTAGE POWER SUPPLY				3-5 Vdc
CURRENT SINK				< 20 mA
GAIN TABLE	TRANSVERSAL PLANE	LONGITUDINAL PLANE		
90°	4	3.5	dBi	
75°	4	4	dBi	
60°	2.5	3	dBi	
45°	1	1	dBi	
30°	-1	1	dBi	
15°	-2.5	-1	dBi	
0°	-6	-3	dBi	

Antenna Installation

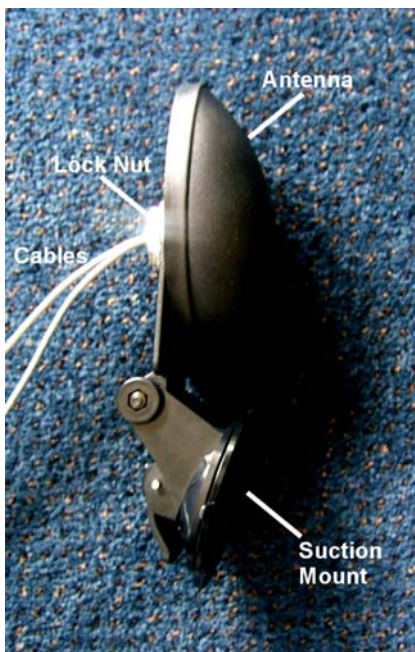
Fixed

The recommended mounting position is on a flat surface, at the vehicle roof. If the surface is not flat (less than a radius of 1m or 3.3ft), then make sure any gap between the surface and the antenna base is sealed with silicon. (e.g. Dow Corning 794s Neutral silicon or similar.) Drill a 16mm (+- 5/8 ") hole in the vehicle roof. Before mounting the antenna, fit the washer in order to seal between the antenna and the roof of the vehicle. Make sure antenna faces forward when tightening the mounting nut (see diagram below). **DO NOT OVERTIGHTEN** (Max. Torque = 2.5 - 3 Nm. or 1.8 - 2.2 ft. lbs). Please note that the coaxial cables are linked to the antenna, so the installer should pass the cables through the hole first and then sit the antenna on the surface.



Temporary/Portable ("Quick Installation")

The user can also install the antenna in a portable mode inside the vehicle. The picture below shows an example of how the antenna suction mounting hardware (sold by Blue Sky Network) can be used to place the antenna from the inside of a vehicle's windshield.



"Portable" Antenna Components



"Portable" Antenna Installation

POWER INSTALLATION REQUIREMENTS

The D3000 voltage requirements are 9-18V - anything outside this limit may damage the unit. If your boat or vehicle's power supply is not within this range, use a DC/DC converter to properly adjust it.

Alternatives for Powering the D3000

a. Cigarette Lighter Adapter ("Quick Installation")

This is the quickest way of getting the D3000 up and running – just plug in the D3000 power interface to your vehicle's cigarette lighter by using Blue Sky Network's adapter (p/n 100297 – below). Please note that we strongly recommend that your vehicle's cigarette lighter provides with a Switched power source (cigarette power is on when vehicle is on). This will prevent the D3000 to drain the main battery while vehicle is turned off. If a Constant power source is used (cigarette power always on), we recommend that the user disconnect the cigarette lighter adapter before leaving the vehicle.



b. Fixed Installation (using factory receiver wires)

This is the case for using the receiver wires from your boat or car panel (below) to power your D3000 unit.



Figure 1

If a specific power harness is not available in your vehicle, you'll need to identify each of the factory radio/receiver wires in order to connect them to the D3000 power connector. Please note that each vehicle receiver connector has a different set of wires with different colors and functions. For example:

Function:	VEHICLE			
	Toyota	GM	Mazda	Ford
	Wire Color			
12V Switched	Gray	Yellow	Blue/White	Yellow/Black
12V Constant	Blue/Yellow	Orange	Blue/Red	Green/Yellow
Ground	Brown	Black	Black	Black

This is just a reference. Please consult your vehicle's installer guide to confirm the right wire for **12V Switched Power** and **Ground**.

POWER-UP TEST

After D3000 is installed or simply placed inside the vehicle with Power and Antenna connections properly secured (see picture below), a Power Up Test (PUT) is strongly recommended. **BEFORE YOU START**, please make sure the unit has been activated and is registered in your SkyRouter user account.



Make sure the Antenna is connected



Make sure the D3000 is powered (9 -18V)

Please follow the three steps below to ensure the unit is working correctly after installation:

1. Turn on your vehicle's Power

When the unit senses external power, it automatically turns on. The D3000's two side LEDs (red/green) turn on (red is constant and green blinks) during initialization and it should take between 15 or 20 seconds before stabilizing at the Main Menu screen.

2. Check the satellite signal strength.

The D3000MD "Menu" screen allows the user to press "Login" (in some special cases it will require a password) to access the unit's features. After selecting "Login", the user can confirm that the antennas are properly installed and connected by observing the GPS and Iridium states at the top of the screen. Iridium and GPS signal strengths can vary between 0 and 5 (it usually takes about 1 to 2 minutes to acquire all the satellite signal information). In a perfect scenario both connections would show 5 bars, but because each vehicle has its own configuration and antennas can be mounted in different ways, it is more common to achieve 3-5 bars (which is still good), unless the antenna has a perfect view of the sky (signal = 5) or completely obstructed by buildings (signal = 0), for example.

3. Confirm that the unit is sending reports

Please check your application (Skyrouter, Intergraph, etc) to make sure your unit is sending/receiving messages, as well as GPS positions.

If you are having problems with any of the steps above, make sure the power connection is reliable, back cables are connected properly and the Antenna has a clear view of the sky.

SERVICE ACTIVATION

A commissioning or service activation must be performed to activate the Iridium modem so the system can be used to send/receive data messages. Service Activation consists of the following steps:

1. Access the Blue Sky Network web site and review the Service Plan options available.
2. Obtain, by contacting Blue Sky Network, and complete the Service Agreement form and choose a service plan to fit your needs. This information on the form is used to set up your account and complete your unit's activation. Once the information is completed and the credit card approved, the unit activation can normally be completed in about an hour.